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TUBERCULAR FEVER

AND ITS



RELATION TO ENTERIC FEVER.

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AUTHOR.

THE object of this communication is, in the first place, to give an account of tubercular fever; and, in the second, to show its relation to enteric fever. The subject will necessarily involve a brief consideration of the nature of both diseases.

A fair history of the origin and progress of tubercular fever will be obtained from the thirteen cases detailed in the following pages. I have found them scattered through the note-books referring to patients admitted under my care into the London Fever Hospital. Excepting one, which is clear enough, I have selected only those of which I could give a *complete* account, and these are necessarily fatal cases. In each case a clear and positive diagnosis was made during the life of the patient, and the cases were respectively designated "tubercular pneumonia," "tubercular meningitis," and "enteric fever," with or without pneumonia. I have applied the term tubercular fever to them collectively, instead of acute tuberculosis, inasmuch as this latter term implies a more chronic and less febrile condition than is exemplified in the following cases.

With regard to the second topic, the relation of tubercular and enteric fevers, the observations I have to make are I believe new, unfamiliar, and, therefore, discordant to received opinions respecting the nature of the latter disease. Medical authors,

it is true, have noted the occasional association of tubercle and enteric fever, but they have all regarded it as a rare and accidental complication, or as a sequel arising from the debility caused by a prolonged attack of the enteric disease. The evidence which I lay before the reader will, I believe, be sufficient to convince him, not only that tubercle may form an actual component of enteric fever, but that fully developed enteric fever may be solely caused by the simultaneous eruption of miliary tubercle in the intestinal glands and in the lungs.

The whole subject of enteric fever is so hedged in by narrow views as to admit of no manner of question as to its nature and cause. "It is a specific disease due to the absorption of a specific poison derived from putrescent animal or vegetable matter." Men who hold this stereotyped view will be ready to say that Case 10, for example, "furnishes no proof whatever of the absence of the proper poison; on the contrary, it is clearly there, and has, amongst other things, caused the outburst of tubercle." Well, this is the ease of St. Peter's hair over again, or rather of St. Peter's no hair. You are asked to believe in the presence of the no hair, as the priest seemingly draws it out between his thumb and finger before your eyes; if your fancy is good you see it at once and clearly, but if you rely only on your gross fallible senses you see nothing, and the professor shakes his head, sighs, and tenderly laments your lack of faith. The grovelling daughter of ignorance, the cankerworm of science, preys much on medicine. As men of science we should never forget the wholesome maxim not to seek the explanation of a connected set of phenomena in more causes than one if that one be sufficient. "But is not the specific poison a sufficient cause?" my opponent will say. "No doubt, if it exists," I answer, "but I have never seen the specific poison. The turgid blood-vessels, and the masses of extruded matter lying upon them, I *have* seen, and to me *this* is the inflammation, and *here* is the efficient cause of all the attendant and consequent phenomena." Is it not so in pleurisy, in pneumonia? Why should it not be so in inflammation of the intestinal glands? Another exception arises. "The inflammatory product

in enteric fever is a *specific deposit*." Then (still referring to Case 10) we may have two kinds of specific exudation deposited simultaneously, the one in the intestinal glands, the other in the lungs or any other part. This, I think, we may fairly conclude is absurd. To grant, then, that the cause and symptoms of enteric fever are occasionally due to tubercular deposit is to set aside the notion that tuberculosis and one variety at least of enteric fever are specifically distinct.

I have long advocated more comprehensive views of the nature of enteric fever, and have insisted that it may arise in any simple inflammatory condition of the body (particularly pneumonia) as soon as the inflammatory action involves the glands of the ileum or colon, and I have shown¹ that this disease is a natural pathological sequence of scarlatina. Case 5 illustrates this sequence, but here the enteritis has assumed the tubercular form.

Nor can the so-called tubercular diathesis be properly regarded as anything more than the result of a greater delicacy of the tissues, or less retentive power of the capillary blood-vessels. The difference, for example, between simple and tubercular pneumonia is merely one of degree. The deposit is excessively fine in the former case, coarse in the latter, and a careful observer will find every intermediate degree in different individuals, and often find it impossible to say whether in a given case the deposit be tubercle or simple exudation. In the robust subject the effusion of coagulable matter is moderate, and lies close upon the outside of the vessels from which it was parted, and within the influence of the absorbent function; and thus upon arrest of the inflammation it may be removed. But it is otherwise with the delicate subject, the frame of tender build; the effusion is poured out more abundantly, and at once forms masses lying indeed upon the blood-vessels, on one side, but too far separated from them on the other to be within the influence of absorbent action. Hence, too, the difference in the pulmonary symptoms in the two cases. In the simple or molecular form as I would call it, of pneumonia the crepitation is excessively fine; while in the granular or tubercular form, coarse crepitant râles are the characteristic sounds. If the

¹ "The Pathology of Scarlatina and the Relation between Scarlet and Enteric Fevers," 'Medico-Chirurg. Trans.,' vol. lv.

lung break down in both cases, the process in the one is rapid, in the other chronic; in the one the expectoration is a thin purulent fluid, in the other it is thick and nummular. But here again variation of constitution produces a corresponding variation in the symptoms. Nature has imposed no limits between simple and tubercular inflammation. The highest powers of the microscope fail to show any difference between recent tubercular deposit and that resulting from simple inflammation. How unreal, then, is the old-fashioned but persistent distinction! Even the few cases I bring together in this communication disprove it over and over again. Are not Cases 12 and 13 capital instances of tubercular meningitis? and yet the solid exudation in the brain did not in either case take the form of tubercle. Not only may recent molecular exudation and old tubercular deposit be observed in remote parts of the same lung, but recent miliary tubercle and the molecular deposit of simple pneumonia may sometimes be continuously traced, by the naked eye, as well as by the microscope, the one into the other.¹ While microscopists quibble about the characters and transformations of tubercular deposit, the physician must avoid being misled by the confusion they create, and hold steadily to the simple teachings of nature.

In defining the association of lung and bowel inflammation in several of the following cases, I have used the term *pneumonenteritis* to denote this condition. It is a term which might be very usefully employed to reclaim a vast number of

¹ At one time of life the blood-vessels may be more retentive than at another, and a person who in early life has had limited tubercular disease of the lungs may subsequently die of molecular pneumonia. Thus John Maskall, æt. 10, after a short illness died of pneumonenteritis. The body was well developed and fairly nourished, but the bones of the lower extremity were slightly curved; the *left lung* weighed ten ounces, it was engorged and friable, being in a condition nearly approaching to red hepatization; in the apex there were several separate masses of old yellow tubercle the size of peas. The *right lung* weighed twelve ounces, it was bound to the chest by firm old adhesions. The lower and middle lobes were adherent and in state of red hepatization, sinking in water, very friable, and the broken surface having the very fine granular appearance of ordinary pneumonia. The upper lobe was in a less advanced stage of the same condition and free from a trace of tubercular deposit. *Peyer's patches* were slightly swollen and congested, and the solitary glands were in a state of psorentery, the lower ones approaching the ulcerative stage. See also Case 9.

cases of enteric fever from the category of specific disease, by referring them to a simple inflammatory action resulting, like ordinary pneumonia, and Cases 1 and 10 narrated below, from exposure to cold.

CASE 1.—*Acute general tuberculosis ; death from exhaustion on the fortieth day ; gallstones.*

Susan King, æt. 40, complexion dark, hair abundant and grizzled, admitted on the thirtieth day of her illness, which commenced with weakness and a violent cold, followed by diarrhœa and fever.

31st day.—Pulse 108; skin moist and hot; bowels inactive; respiration 28. Occasional cough and copious clear frothy expectoration. The chest was resonant, but there was coarse crepitation in the lower lobes of both lungs. At times she was delirious.

32nd day.—Bowels acted once; the stool was formed, and of a bright gamboge colour.

33rd day.—Three loose stools. Delirious and refused to answer. Crepitation extended over the back of the chest.

She continued to get worse, becoming drowsy and apathetic. The pulse varied from 100 to 116; the tongue became dry and brown; and although the abdomen was collapsed, there was persistent diarrhœa, the stools being pale and watery and on the

39th day the watery stools were passed involuntarily. She lay on her back, and there was twitching of the lips. The pupils were equal, moderately dilated, and sensible to variations of light. There was no appreciable dulness of the chest, but there was diffuse coarse crepitation. The pulse rose to 128 next day, when she sank and died, the diarrhœa persisting to the last.

The body was emaciated. The upper part of the *ileum* was firmly invaginated for four inches, but there was no swelling or inflammatory action whatever. *Peyer's glands* were slightly swollen and injected. The *solitary glands*, for a distance of three feet above the valve, formed white prominent elevations, a few only being red. The glandulæ of the large intestine were healthy. The ascending *colon* was vividly injected with points of ecchymosis. The *mesenteric glands* were healthy. The mesentery and mesocolon presented a number of circular black spots, with soft yellowish centres, old extravasations of blood, doubtless. The *liver* was a little fatty, and weighed three and a half pounds; the outer surface presented at intervals patches of miliary tubercle. The gall-bladder was collapsed and contained twenty small, angular, yellow gallstones.

The *spleen* was greatly enlarged, weighing fourteen and a half ounces, and was abnormally firm, but sections had a natural appearance. The *kidneys* weighed together eight and a half ounces; the cortical portions were studded with greyish-white raised tubercles, exactly resembling those of the pleura. The surfaces of the *mesentery*, and of the *peritoneum* in contact with the liver, were also strewn with miliary tubercle. The *pleural surfaces of both lungs* were rough, and appeared as if dusted with fine sago, and both organs were everywhere pervaded

with similar greyish-white miliary tubercles, which contrasted vividly with the firm, dark-red, congested tissue between them; the left weighed twenty-five ounces, it was bound behind by old adhesions; the right weighed thirty-two ounces. The bladder was distended. Excepting a slight deposit of jelly-like lymph upon the membranes covering the pons, and thence to the optic commissure, the brain and its membranes were healthy.

Here is an instance of general inflammation of the parenchymatous organs with *tubercular* effusion into the lungs, the pleuræ, the kidneys, the solitary glands of the ileum, and probably the spleen, and *molecular* (common) effusion upon the membranes at the base of the brain.

CASE 2.—*Acute tubercular pleuro-pneumonia in a scrofulous subject; death on the thirty-third day.*

Thomas Quinlan, æt. 19, admitted 13th September, 1870, on the third day of his illness, which began with pain in the chest and great weakness. The left side of the neck was seamed with old strumous cicatriees.

3rd day.—Physical signs of consolidation of the whole of the left lung, with fine crisp crepitation. Similar crepitation, but no marked dulness or bronchophony in the antero-inferior part of the right lung. Pulse 144, resp. 36. Flushing; sordes. Tongue moist, with a yellow fur.

The patient continued in much the same state until the twenty-sixth day, the bowels being rather confined, the cough slight, and expectoration of viscid mucus scanty. He lay chiefly on the right side, and although the respirations sleeping were usually 40 in the minute, he was tranquil and seemed free from all distress, and slept and spoke calmly. Latterly there was profuse sweating, and beads as large as peas constantly accumulated on the flushed face.

On the 28th day he was evidently growing weaker, the pulse being 136, resp. 44, and the temp. very high, notwithstanding the copious perspiration. The expectoration had become freer, and was partly frothy and tenacious, and partly smooth. The weakness increased without any other alteration in the condition of the patient, and he gradually sank and died on the thirty-third day.

The *left lung* was enormous; it was fully expanded and consolidated, forming a complete cast of the right chest, showing depressions corresponding to the ribs, pericardium, and diaphragm, and weighing three pounds seven ounces! It was everywhere adherent by a thick, leather-like, recent membrane. It was infiltrated with yellow tubercle, which, having completely invaded the lung-tissue and become confluent, rendered the organ almost non-vascular, and gave it a dry, marbled, red-and-white appearance. The apex had broken down into a cavity the size of an egg, and there were small tunnels in the immediate vicinity converging into the cavity.

The *right lung* was similarly adherent; it was also nearly solid, friable, and red, and presented nodules of yellow confluent tubercle here and there.

One *Peyer's patch* was slightly raised, and the mucous membrane of a portion of the ileum was so vascular as almost to bleed.

CASE 3.—*Acute tubercular pneumonenteritis; suppuration of the lung; recovery.*

Mary Roach, æt. 25, was admitted on the fourteenth day of her illness (22nd March, 1870), which began with rigors, pain in the back and stomach, and sickness.

16th day.—Pulse 104; skin hot; tongue moist, thickly coated with chalk-like fur. Bowels loose. Vomited a little dark bilious fluid.

18th day.—Pulse 88. Bowels still loose, and motions green and semi-solid. Had a slight cough and scanty muco-purulent expectoration. No physical signs of pulmonary disease. There was general desquamation of the cuticle, such as occurs after an ordinary attack of scarlatina.

28th day.—Continued in the same state, but some large crepitation was heard in the lower part of the right lung. The expectoration was purulent and flaky, and the loose stools were yellow.

30th day.—Sputum nummular.

Up to the 50th day her condition was unchanged. She lay in an apathetic state, apparently incapable of comprehending, and never answering the questions addressed to her. The brain was probably oppressed by slight effusion. The pulse ranged from 132 to 100, the temperature remaining high (about 103°), and the skin dry throughout. The diarrhœa was kept in moderate control by opiate enemata. There was occasional vomiting of greenish bilious fluid. The cough was troublesome, and the expectoration was abundant and purulent.

On the 52nd day she was much improved, beginning to observe what was going on around her, and answering questions. The vomiting had ceased, the febrile symptoms were diminished, and the diarrhœa was in abeyance. The dry parched tongue became moist again, and assumed the chalky-white fur which characterised it in the earlier part of her illness. The right upper lobe of the lung gave imperfect resonance and respiratory sounds, and the expiration was prolonged. The physical signs were not very marked, but, considering the character and quantity of the expectoration, it was pretty clear that the upper part of the right lung was breaking down. There was no apparent emaciation, no marked clubbing of the nails, but the hair was falling off.

No marked progress occurred until about the sixty-fourth day, when the tongue became clean, and a healthy hue returned to the face. The sputum, which had again become more consistent and nummular, now began to decrease in quantity, and when she was discharged, a fortnight afterwards, the cough and expectoration had nearly ceased, the appetite was normal, and the bowels regular.

Viewed in the light of the other cases, and with the positive evidence furnished by nummular sputum, I think it will be conceded that the diagnosis which I have given of the foregoing case is correct.¹

¹ The more diffuse suppuration of simple pneumonia, as far as my experience goes, furnishes a different sputum.

CASE 4. — *Acute tubercular pleuro-pneumonia; severe and persistent diarrhœa; slight deposit of tubercle in the ileal glands; death on the thirtieth day, the event being accelerated by epilepsy.*

Kate Newman, æt. 18, was admitted on the seventh day of a febrile attack, which began with headache, shivering, and looseness of the bowels.

7th day.—Pulse 120; skin hot and dry; tongue white and moist, but inclining to dry; respiration 30; lower lobe of right lung dull, with fine crepitation; a dry cough; bowels loose.

9th day.—Sharp pleuritic pain beneath the right nipple; bowels very loose, stools light coloured.

10th day.—Pulse 132; resp. 36; cough still dry; free perspiration.

12th day.—Crepitant râles over the whole of the right lung, very crisp at the apex; scanty muco-purulent expectoration; left lung normal. The bowels had acted once a day only during the last three days.

15th day.—Had an epileptic fit (to which she was liable) to-day.

16th day.—Signs of increasing consolidation of the right lung, crepitation becoming general in the left. Pulse 120; cheeks flushed; return of diarrhœa.

18th to 21st day.—The diarrhœa was checked to-day. Pulse 132; resp. 48; cough very troublesome, with scanty expectoration of frothy mucus.

24th day.—Tongue white and moist; temp. 103° Fahr.; much flushing. The whole of the right chest dull, with fine, dry, crepitant inspiration, most marked at the apex, and bronchial breathing, wheezing, and crepitation, in the left apex; cough short, dry, and troublesome.

25th day, 9 a.m.—Temp. 104°; 9 p.m. 103·4°.

26th day, 9 a.m.—Temp. 102·4°.

27th day, 9 a.m.—Temp. 103°, 9 p.m. 102·6°; pulse 144, thready; resp. very short, frequent. The cough was still very troublesome, and at times she now expectorated an ounce of frothy, nearly clear bronchial sputum. This began to excite vomiting, and her strength was rapidly failing. On the

30th day she was seized with another epileptic fit, which lasted ten minutes, and terminated in death. She continued bright and intelligent up to the time of this convulsive attack.

The body was slender and somewhat emaciated. *The right lung* was adherent to the chest-wall and diaphragm by new and tender dryish membrane; it weighed forty-two ounces. The whole lung was disseminated with rather coarse granules of yellow tubercle, which were separated by very short intervals of bright red, half-consolidated lung-tissue. The apex was quite solid, the tubercles being nearly confluent. *The left lung* weighed fourteen and a half ounces; it was partially adherent at both base and apex. The apex was slightly wrinkled, back and front, and beneath the puckerings were masses of fine granular tubercle. The lower lobe, particularly the posterior part, was strewn with yellow tubercle, but more sparsely than the right. *The spleen and mesenteric glands* were normal. *The small intestine* contained slimy, semifluid, gamboge-coloured faecal matter. Ex-

cepting a little yellow deposit in a few of the follicles of a Peyer's patch here and there, and a similar swelling of a few of the solitary glands, the ileum was healthy.

The brain and its membranes were healthy; the ventricular fluid was rather abundant.

Here with a strong tendency to cerebral excitement the brain escaped all inflammatory deposit.

CASE 5.—*Scarlatina, followed by tubercular pneumonenteritis and suppuration of the lung; death on the thirty-eighth day.*

Alice Allaway, æt. 15, admitted on the third day of an attack of scarlatina.

3rd day.—General scarlet rash; fauces and tonsils deep red and swollen; pulse 100; tongue red, clean, and moist: constipation.

4th day.—Pulse and tongue unchanged; pupils moderately dilated; rash fading; bowels open.

5th day.—Pulse 104; tongue moist; rash still present.

6th day.—Pulse 92; skin cool; tongue dry in the centre; slight sordes; slight delirium.

7th day.—Troublesome cough; respiration slightly accelerated; large crepitation over the back of the chest.

8th day.—Pulse as the two previous days, 92; tongue moist, slightly coated. The active pulmonary congestion progressed, as was evidenced by increasing dullness of the chest and frequency of the breathing. On the

14th day.—The lower two thirds of the left lung was completely dull, and tubular breathing had in great measure taken the place of the crepitant sounds. She lay on the left side; the pulse was 124 and full; the face was flushed; sordes accumulated on the teeth; the tongue was dry in the centre; the rash had disappeared, and there was much desquamation. The abdomen was moderately distended, diarrhoea set in, and the liquid stools were of a light yellow colour.

17th day.—No amelioration; pulse increased to 136; respirations to 44; tongue dry and fissured; large patches of cuticle were still separating; the abdomen was not so full, but there was gurgling on the right side and moderate diarrhoea.

20th day.—In the same condition; distressed with a harsh cough; no expectoration; pulse 144; respiration as she slept 36; face pale and pinched; bowels still loose.

For the next two days she improved considerably. During this time there was only one rather loose stool; the pulse fell from 116 to 108, the tongue was moist, and the sordes began to clear away; the cough was less severe, and she took custard.

25th day.—Worse again. Pulse 124; respiration 32; return of diarrhoea; pallor and prostration; the cough deep and powerless; lay sleeping on the left side with the eyelids a little separated. She continued in the same state for the eleven days following, the cough and diarrhoea persisting, the former being short frequent, and unattended by expectoration.

37th day.—The thin pulse was composed of 132 feeble undulations; the tongue was moist, red, and but slightly coated; there were two liquid pale evacuations; she still lay on the left side, scarcely alive, and this morning expectorated half a pint of yellow pus. The next day she died of prostration, having made, during the preceding fortnight, two or three attempts to rally.

The body was completely emaciated, the abdominal parietes being excessively thin; the pale, mottled, fatty *liver* descended to within half an inch of the navel line: it weighed forty-two ounces; there was an ounce of dark green bile in the gall-bladder. The *spleen* was pale, of normal consistence, and weighed three ounces. The *mesenteric glands* were large, dusky, soft, and leathery. The *Peyerian glands* near the valve were thickened and congested; those for some space above were congested and slightly swollen. The mucous membrane of the ileum presented patches of injection. There was general psorentery of the solitary glands in the last foot of the ileum, the glands being white, firm, and prominently raised. The *kidneys* were healthy but pale, and weighed together seven and a half ounces. The *right lung* was bound above and behind by old adhesions; it weighed fourteen and a half ounces, and was everywhere crepitant and free from deposit. The *left lung* was also firmly adherent at the side; it weighed thirty-five ounces; the apex only was free from deposit, and retained crepitancy, though but feebly; the lower part of the upper lobe was firm and excavated by small, tunnel-like, ragged cavities; the lower lobe was everywhere thickly strewn with fine granules of yellow tubercle, some of which were confluent in masses the size of a pea.

Scarlatina frequently passes into enteric fever by necessary pathological sequence, and the foregoing history is a case in point, the only difference being that in this case the deposit took the tubercular instead of the simple inflammatory form.

The one lung escaped, probably, on account of defective vascularity from previous disease. The enteric inflammation was in this case quite secondary to the pulmonary.

CASE 6.—*Acute tubercular pneumonenteritis; death on the thirteenth day from the accession of the febrile symptoms.*

Kate Gaynor, æt. 7½, admitted January 4, 1870; the members of her family are healthy except one who has some "complaint of the chest." The patient had been failing in health six weeks, and ill with fever and shortness of breath the ten days before admission.

10th day.—Great prostration. Sordes. Pulse 132; respirations 70. Skin dry and hot.

11th day.—The prostration was too great to make a thorough examination of the lungs, but there was diminished resonance, and diffuse coarsish dry crepitation over the whole of the back, with pleuritic sounds. Pulse 152; resp. 70.

12th day.—Decubitus on right side; pulse 160; resp. 80. Knees drawn up abdomen moderately full, painful on pressure. Bowels open, loose.

13th day.—Increased prostration and death.

The body was slightly emaciated. *The lungs* were swollen, heavy, and but slightly erepitant, the lower lobes were adherent to the chest wall by soft lymphic exudation. The texture of the lung resembled that of the adult spleen, and every portion of both lungs was thickly studded with white opaque miliary tubercle, the intervening lung tissue being engorged and of a vermilion-red colour. *The mesenteric glands* about the lower part of the ileum were enlarged and purple. A distinct deposit of yellow tubercle, the size of a pea, occurred in the mucous membrane of the *jejunum*. The lower end of the *ileum* was severely congested, the vessels being perfectly injected and turgid, there was general psorentery, the straw-coloured glands appearing like a pustular rash upon the purple mucous membrane: two feet from the valve many of the solitary glands were more diffusely swollen, purple, and ulcerated at the centre. The two *Peyerian glands* next to the valve had each two round ulcers $\frac{1}{4}$ " in diameter, the edges were red and raised, and the centres were dark and sloughy. A foot from the valve a similar ulcer occupied the centre of another Peyer's patch, which was generally inflamed and swollen. The agminated glands generally were purple and swollen and one or two almost bleeding, and at intervals as high as the first fourth of the ileum their centres were occupied by angry ulcers. *The cæcum* was greatly congested. *The spleen* weighed $3\frac{3}{4}$ ounces; in appearance it resembled the lungs, but it was more compact and the tubercular matter was in finer grains. The brain, kidneys and supra-renal organs and liver were healthy. The gall-bladder contained a moderate quantity of healthy bile.

On admission the symptoms of both pulmonary and enteric inflammation were well developed; previously there had been no diarrhœa. The tubercle was no doubt deposited in the affected organs simultaneously. The pulmonary symptoms were prominent throughout; the enteric disease was only declared three or four days before death, although during the period of its latency it had partly passed into the ulcerative stage.

CASE 7.—*Acute tubercular pneumoenteritis with symptoms of severe enteric fever; pneumonia on the eighteenth day; cessation of the enteric symptoms on the thirty-second day; extension of the pulmonary disease with suppuration; death from asthenia on the sixty-third day.*

Isabella Beaver, æt. 19, admitted 11th August, 1870, on the sixth day of a febrile attack of which no satisfactory history could be obtained.

6th day.—Pulse 116; tongue white and moist; skin hot and pallid; one rose spot on the abdomen, and there had been two liquid light ochre-coloured stools during the previous twelve hours.

8th day.—The patient was in a listless state, with the eyes wide open, and occasionally delirious. No answer could be obtained from her, and she held fluids a long time in her mouth before she attempted to swallow them. Pulse 120.

9th day.—The nape having been effectually blistered, she exhibited more intelligence to-day, but the diarrhœa continued.

10th day.—Twice had considerable hæmorrhage from the bowels, and this recurred on the eleventh day when the pulse was 144; the tongue yellow and moist, and the general condition and appearance of the patient was much improved.

13th day.—Pulse 132, respiration 32; which led to an examination of the chest; the respiratory murmur, however, was still normal. There were six liquid stools during the previous twenty-four hours, but the hæmorrhage had finally ceased.

18th day.—The diarrhœa continued profuse; the cheeks were flushed, and there was muscular tremor and great restlessness. Crepitant râles were now heard over the back of both lungs, and there was occasional cough, but no expectoration. The pulse 132, the respirations 32.

On the nineteenth day there was scanty expectoration of frothy mucus, and on the twenty-first day the expectoration was free, otherwise she remained in the same critical state, the diarrhœa still persisting, and the respiration being 36. She continued in the same state, with a pulse of 132, during the next week, but on the twenty-seventh day there was decided improvement, the bowels which had been moved three times the previous twenty-four hours were now quiet. She slept comfortably under the influence of twenty grains of chloral hydrate, and the respirations while sleeping were reduced to 24. The expectoration was purulent.

37th day.—The diarrhœa having now ceased for several days, and the patient being generally much improved, she was allowed fish diet. Constipation followed, the abdomen being dull and retracted, and on the forty-seventh and four following days, simple enemata were given, and each brought away a stool composed of brown fluid and numerous scybala.

On the 51st day the motion consisted of dark-brown slimy fæces destitute of scybala; the pulse was 128, respiration about 30, the skin cool; the patient looked bright and clear, but she was greatly emaciated, and was much troubled by a hard cough attended with free expectoration of mucopurulent matter. The chest was now dull behind and over the left front, and the respiration was bronchial. Although the appetite was good, the pulse was small and feeble, and the emaciation continued. She was now contending with the suppuration of the lungs, and resembled a patient in the last stage of phthisis.

On the 60th day she was much worse from failure of heart force. She rallied, however, and on the sixty-second day the thready pulse was 120, the respiration 30; the tongue was clean and dryish, the cough loose, and the expectoration opaque, purulent, and smooth. The next day, however, she relapsed and, having gradually sunk, died on the sixty-fifth day.

The body was completely emaciated. The apex of the *right lung* was strewn with sago-like grains of tubercle. The apex of the *left lung* was excavated into a ragged cavity, invading the whole upper third of the lung, the contiguous portions being riddled and tunneled with purulent passages. The lower two thirds of this lung were quite solid, the semihepatized red tissue being crowded and mottled with grains of yellowish tubercle the size of a millet seed. The intestines were greatly attenuated. The *peritoneum* was quite healthy, excepting that

there were three or four little rounded masses of solid lymph upon the lower third of the *ileum*, and these corresponded to ulcerations which had passed through all the coats of the bowels, and thus extravasation was prevented. The lower third of the *ileum* was very thin and fragile; all the *Peyerian glands* were occupied by depressed, ashy-looking, smooth ulcers, about the size of a shilling; they were all in an advanced state of cicatrization, but the edges of some were raw with fine red granulations.

In this patient the deposit of tubercle in the lungs was declared on the thirteenth day, when the enteric inflammation was at its height, and very soon the pneumonic symptoms superseded the enteric. This is precisely what occurs so often in the worst cases of enteric fever, and but for the post-mortem examination of the body, or I should rather say of the lungs, the present case would have been regarded as typical of enteric fever, attended with pneumonia.

CASE 8.—*Acute tubercular meningitis and pneumonenteritis, with ulceration of Peyer's patches; death on the eleventh day from the supervention of febrile symptoms, probably the fourteenth or twenty-first of the disease.*

Marian Snow, æt. $3\frac{1}{2}$, admitted on the fifth day of a febrile attack.

5th day.—Pulse 120; tongue moist, with a white fur; skin hot; cheeks with a deep circumscribed blush; drowsiness.

6th day.—Pulse 84; temp. $99\cdot6^{\circ}$; was still drowsy; pupils equal, $\frac{1}{3}''$.

7th day.—Pulse 84; skin cool; had a more lively expression and protruded the tongue when asked to do so; it was moist and only slightly coated.

8th day.—Not so well; pulse 116; drowsiness increased; cheeks with a patchy flush; drank badly; inequality, but free mobility of the pupils.

10th day.—In a semicomatose state, with the eyes half closed; pulse 120; pupils equal; skin hot and cheeks flushed; refused to swallow. The bowels had acted naturally throughout, and to-day the motion was solid, but it was passed involuntarily. The little patient sank the next day. The body was *well developed and fairly nourished*. The brain, excepting the upper part of the cerebral lobes, was unduly soft, and there was more than the normal amount of fluid in the ventricles. The arachnoid lying between the cerebrum and cerebellum, and, in a less degree, the choroid plexuses, were studded with small white tubercles a little larger than pin's heads. The *left lung* and pleura were healthy; the visceral layer of the *right pleura* was studded with white tubercles the size of hemp seed; the *lung* itself weighed five ounces and was bound by old adhesions behind. The upper lobe was healthy; the middle was adherent to the other two by old adhesions, and it was stuffed internally with sago-like grains of tubercle; the lower lobe was in the same condition, and contained just within its anterior margin a hard round

mass of caseous tubercle the size of a marble. One of the bronchial glands had undergone a similar degeneration, and the cheesy matter was enveloped in a semi-cartilaginous capsulc. The *mesenteric glands* were pale and large, and those about the junction of the large and small intestines formed a heavy knotted mass. A few small nodules of formed bright yellow fæces were washed from the bowels. The whole of *Peyer's patches* were injected and swollen, those in the lowermost part of the ileum formed cockscomb-like processes; the rest were more or less ulcerated, and many of the ulcers appeared to be in process of healing. A large Peyerian gland three feet from the valve had several small rounded ulcers, and one of them had penetrated to the peritoneum, and caused inflammatory adhesion of the part to a contiguous coil of intestine. The other organs were healthy.

This case illustrates the not uncommon fact that there may be serious ulceration, even to impending perforation of the ileal glands, without any appreciable indication of this condition. The lung and bowel mischief had probably been latent for two or three weeks; decided febrile symptoms appeared to have arisen at the time when the brain became implicated in the general tubercular deposit.

CASE 9.—*Acute pneumonenteritis in a tubercular subject; death on the twenty-ninth day, chiefly from peritonitis, caused by one of the intestinal ulcers.*

John Cash, æt. 14, admitted 28th June, 1870, on the twenty-first day of his illness, which, for the first nineteen days, amounted to nothing more than sickness after meals, headache, and languor, but the last two days there had been profuse diarrhœa and delirium.

22nd day.—Pulse 130. Tongue dry and wrinkled at the centre. Bowels still loose. One or two doubtful rose spots.

23rd day.—Pulse 140. Active congestion of the lower lobes of the lungs. Bowels very loose.

24th day.—Pulse 144, respiration 36. Occasional dry cough. Right chest dull in front. Fine crepitation and bronchial breathing over the whole of the lung. Two loose stools.

25th day.—Pulse 136, resp. 38. Fine crepitation over the upper half of the left lung in front. Delirium, sordes, and diarrhœa.

During the next four days the pulmonary inflammation and prostration increased. There was no expectoration, and the bowels were open once a day, and on the twenty-seventh day the stool was reported, "natural." The pulse ultimately rose to 156, and the respirations to 60, and he died on the twenty-ninth day. One or two fresh rose spots appeared at intervals.

The body was rather fat and the frame large. The *right lung* was bound to the chest by very strong old adhesions in front, and by slight ones at the apex and

behind. It was in the first stage of molecular pneumonia, and only faintly crepitant. The apex was wrinkled by pea-like masses of old tubercle, lying near the surface, and surrounded by tough, carnified lung-tissue. The apex of the *left lung* was shrivelled, puckered, and knotty, obviously having been the seat of a tubercular cavity. The rest of the lung was healthy, but the lower part was engorged. There was severe peritonitis arising from a vascular spot upon the *ileum*, nine inches from the *cæum*. There were rather hard masses of bright ochre-coloured *fæces* in both large and small intestines. *Peyer's patches*, for the most part, were gravely ulcerated throughout the *ileum*. The ulcers were red and angry looking, not much raised, and usually invaded only a part of the gland tissue in an irregular manner, so as to leave islands and processes of unaffected gland structure, which had the shaven-beard appearance. One of the ulcers lay on the peritoneum and caused the peritonitis, which glued the pelvic coils of intestine together, and covered them with solid granular lymph and pus. The solitary glands near the valve formed yellow elevations. The *mesenteric glands* were greatly enlarged and very vascular. The *spleen* weighed four ounces, and the *gall-bladder* contained a little thin, orange-coloured bile.

CASE 10 — *Acute and very severe tubercular pneumonenteritis ; typical symptoms of enteric fever from first to last ; death from prostration on the twentieth day.*

Charity Garner, æt. 15, admitted on the eighth day (February 1st, 1870) of a febrile attack, which began with a severe chill and loss of appetite, followed by diarrhœa. She had been remarkably healthy previously.

8th day.—Pulse 116 ; skin hot and dry. Tongue moist at the edges, dry, red, and cracked in the centre. Face flushed. Eight or nine rose spots on the abdomen. Bowels loose.

9th day.—A few fresh spots. Three loose dark-coloured stools.

10th day.—Pulse 104 ; moisture on the wrists. Three fresh spots. Four loose ochre-coloured stools. A little *sordes* and delirium.

The disease progressed during the following days, the rash coming out each day. The abdomen became full, painful, and tender, and she was reduced to a typhous¹ condition.

On the 19th day there was extreme prostration and apathy, the pulse was 160, the tympanitic distension of the abdomen was increased, and the motions were frequent and watery. She died next day.

The body was finely developed, and there was a layer of fat on the abdomen three quarters of an inch thick.

The *large intestine* was healthy. The *ileum* was severely congested, and the last twenty-six inches was the seat of intense inflammation, all the *glands*, *agminate* and *solitary*, being in a state of ragged ulceration, some with grey or black sloughs, but the majority were stained yellow ; the edges of the widely spread ulcers were dusky purple, almost bleeding, and raised a quarter of an inch above

¹ The author uses this term instead of "typhoid," which should now become obsolete.

the mucous membrane. One ulcer lay on the peritoneum; above this, Peyer's patches were but slightly congested, but the whole of the solitary glandulæ were as large as hemp-seeds, very turgid, and of a vivid purple-red colour. Still higher up the solitary glands were in a state of simple psorentery, forming white prominences in the mucous membrane. The corresponding *mesenteric glands* were purple, and as large as walnuts. The *spleen* weighed twelve ounces; it was of normal consistence.

The *liver* was large, doughy, and greasy, weighing four pounds seven and a half ounces. The gall-bladder contained two drachms of watery, yellowish-brown bile. The *kidneys* were large, weighing together seventeen ounces; they were congested, but otherwise appeared healthy. There was only one *ovary*, which was healthy, and double of the normal size.

The *lungs* were of the consistence and dark-purple colour of the spleen, and the lower lobes were thickly strewn with fine grains of greyish-white, tubercular deposit, which gave to the sections a very marked mottled appearance. The contiguous parts of the superior lobes partook of this condition, but the deposit gradually disappeared above, and was absent from the summits, which were merely in a state of active red engorgement, and still retained some crepitaney. The bronchial glands were dark purple and greatly enlarged.

The *pleuræ* were healthy, but, as the tubercular deposit could be felt through the membrane, the surfaces of the lungs were granular to the touch.

The *heart* and *brain* were healthy.

In this patient the intestinal lesions were absolutely typical of the worst forms of enteric fever, and the lungs as absolutely typical of tuberculosis.

The only pulmonary symptom throughout was hurried breathing, such as is commonly called nervous. The patient was in too critical a condition to bear the disturbance which an examination of the back of the chest required.

The so-called nervous breathing in enteric fever is usually dependent upon active pulmonary congestion, as is exemplified in this case.

It may be assumed that both bowel and lung mischief arose simultaneously on the day when the patient took cold.

CASE 11.—*Acute tubercular meningitis and pneumoenteritis; death from meningeal inflammation on the twentieth day.*

Emily Chaffers, æt. 11, admitted 18th April, 1870. She was a healthy lively child before her illness, which began suddenly with rigors followed by severe vomiting and purging.

8th day.—Pulse 92; skin hot and dry; tongue white and moist.

9th day.—Pulse 108, one liquid light-coloured stool. Abdominal tenderness.

11th day.—Pulse 102; no action of the bowels for thirty-six hours; vomited a little green bilious fluid.

16th day.—Pulse 112; tongue moist and slightly furred. Slight ptosis and external strabismus on the right side; return of vomiting. Abdomen collapsed; bowels confined.

17th day.—Wandering and moaning almost constantly, and when aroused complained of pain in the head and arms; conjunctiva much injected; persistence of right ptosis, and wide dilatation ($\frac{1}{3}$ "') and insensibility of the right pupil. A simple enema was followed by a natural stool.

The nape and subsequently the shaven head were blistered, but she gradually grew worse and died on the 20th day. Two days before her death the left pupil was contracted and active, the next day the pupils were equally dilated and fixed, she was semi-comatose, occasionally crying out with pain in the head. The previously constipated bowels were again loose, and both fæces and urine were passed involuntarily; the body was moderately well nourished. *Under the right parietal bone* for an area of three square inches there was a deposit of miliary tubercle in the white lymphic arachnoid; great venous congestion of the brain; and distension of the ventricles with clear fluid. At the base of the brain, from the optic commissure to the pons, the nerves were surrounded by a thick matting of lymph, and the third of the right side seemed to be constricted by a cord of firmer texture than the rest. There was a limited deposit of tubercle in the summits of *both lungs*; in one the deposit was partly cretified. The *spleen* and *mesenteric glands* were moderately swollen, the intestines were empty, *Peyer's patches* were generally congested, and two or three of those on the lower part of the ileum were the seat of small, round, pale ulcers.

Very many cases of enteric fever begin thus suddenly, probably from severe chill. The vomiting and diarrhœa at the outset, no doubt, marked the deposit of tubercle in the ileal glands, and just as pneumonia sometimes supersedes the enteric symptoms, so in this patient did the indication of brain mischief take the precedence, and during the latter half of the illness the meningeal inflammation appeared to be the sole affection.

CASE 12.—*Scarlatina (?) followed by acute tubercular meningitis and pneumonia; death from effusion into the cavities of the brain on the 33rd day.*

Wesley Bartlett, æt. 6, admitted on the 30th day of a fever of which no history could be obtained, but the father died this day.

30th day.—Pulse 100; skin hot and dry, with slight desquamation and faint injection over the trunk and extremities. Face pale. Tongue moist with a thick yellowish fur. Abdomen retracted; one rather loose light-coloured stool. Some noisy delirium and restlessness.

31st day.—Pulse 108; the next day 156; occasional screaming. To-day the left eyelid became tumid and drooping with wide dilatation of the pupil, which was, however, directed forwards. Tongue dry, clean, and red.

32nd day.—Pulse 140; Resp. 20, sighing and irregular, sometimes an interval of five seconds between the inspirations, which were accompanied by a sucking sound. Sibilant and suberepitant râles heard all over the chest: an occasional cough. Retention of urine.

The little patient died comatose on the following day. The body was much emaciated; the urinary bladder was distended with healthy urine.

The meninges were severely congested; tough solid lymph was effused at the base of the brain between the crura cerebri, involving the 3rd nerve of both sides; the effusion thinned away over the pons and medulla; the ventricles were distended with clear pale serum.

The lungs were fully inflated, each weighed 8 ounces and each was speckled with miliary tubercle, the intervening lung substance being dark red. The *pleuræ*, the *spleen*, the *mesenteric glands* were quite healthy. A firm white clot occupied the cavities of the right heart. *Peyer's patches* were slightly red and swollen here and there.

No doubt the inflammatory products in the brain were identical in character with those in the lungs, and as these were in the form of miliary tubercles, so we must conclude that the meningitis was tubercular. Indeed, the symptoms and post-mortem appearances are those of the majority of cases of tubercular meningitis.

CASE 13.—*Acute tubercular meningitis and pleuro-pneumon-enteritis; death on the twenty-third day from effusion into the cavities of the brain.*

Henry Manning, æt. 11, admitted Dec. 20th, 1866, on the 22nd day of his illness, which commenced with fever and diarrhœa, and afterwards presented the ordinary symptoms of enteric fever; latterly there had been much delirium.

22nd day.—Was quite unconscious and tossed the head about continually; the eyes were closed and the pupils dilated, the left one more so and fixed. The pulse was rapid and almost imperceptible; the tongue moist and covered with a thick fur; the temperature high; the abdomen flaccid and the bowels quiet. The patient sank and died the following day. The body was spare but well developed. *The membranes* at the base of the brain were severely inflamed and a layer of toughish yellow lymph covered over the pons and the parts in front as far as the optic commissure; the ventricles were distended with yellow serum. *The brain* was congested and the left optic thalamus decidedly swollen, but the substance throughout appeared healthy. *The pericardium* was full of fluid, but the surfaces were quite smooth. *The lungs* weighed 29 ounces; both were everywhere adherent by friable organizing membranes; the apices were solidified by greyish-yellow,

tubercular deposit the size of hemp seeds ; the lower lobes of both were engorged red, and tough. *The liver* was attached to the under surface of the diaphragm by new adhesions similar to those between the pleura ; it was healthy and weighed 29 ounces. *The gall bladder* contained half an ounce of thick healthy bile. *The spleen and mesenteric glands* were purple and swollen. The pale intestines contained formed healthy faeces. Several *Peyer's patches* in the last four feet of the ileum were red and swollen, and several more in an angry state of ulceration ; the ulcers were dark purple, raised and with irregularly contracting edges. The patches about the valve formed one continuous surface of ulceration.

In this case, again, the meningeal exudation was molecular and not tubercular.

I conclude with a few words as to the relative frequency with which the inflammatory products assume the tubercular and molecular forms respectively in enteric fever. In cases 1, 5, 6, 7, 8, 9, 10 and 11, above described, the symptoms were those of the worst forms of enteric fever, and during life the cases were regarded as such. In the interval of their occurrence 307 cases of enteric fever came under my care. Of these 51, or about 17 per cent., died. Of the fatal cases I made 43 post-mortem examinations, and 8 of these, or 18·7 per cent., were the cases above referred to. But inasmuch as tubercular exudation is necessarily more fatal than the molecular form, this is too high a number, and in reference to the whole number of cases of enteric fever it would probably fall to less than half. Still it is a very noteworthy fact that 8 or even 5 per cent. of ordinary cases of enteric fever may be associated with the deposit of tubercle.

Since our prognosis will be affected to a certain extent by the form of the deposit, it becomes a matter of practical importance to determine whether it is assuming the tubercular or molecular form.

When the ileal glands alone are affected the distinction between tubercular and enteric fevers is absolutely *nil*, but there is usually more or less pulmonary complication ; then a diffuse noisy crepitation in a considerable portion of a lung is to me a mark of tubercular deposit. Thus during life as well as after death the distinction will generally be carried back to that which subsists between tubercular and simple pneumonia. For further observations on this topic I must refer the reader to my article on enteric fever in 'Reynolds' System of Medicine.'

